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COMMERCIAL GROWING OF WATERCRESS

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Watercress (Radicula nasturtium-aquaticum) is a perennial, succulent, leafy plant that belongs to the cabbage family. It is high in mineral and vitamin content and rates high as a leafy salad green. For commercial purposes it is grown in unshaded shallow pools of flowing clean water. Localities suited to commercial production are characterized by limestone rock formations and by springs and brooks with clear water relatively high in lime content. Because of its perishability most watercress is sold either directly to dealers in large cities that have special facilities for handling it or directly to hotels and restaurants.

Climate

Watercress does best in a moderately cool climate but is grown over a wide range of territory. Production is most highly developed in the hilly limestone regions of Virginia, Maryland, and Pennsylvania, where neither summer nor winter temperatures are extreme. Winter supplies are grown in the South; summer and autumn supplies are grown in the North.

The submerged portion of the plant will survive during the winter as long as the water surrounding it does not freeze completely. During the winter, air temperatures immediately above the water surface must be high enough to promote growth. This will be determined by the temperature and volume of water emerging from the spring as well as surrounding air temperature.

Water Supply

A large supply of drinkable water is the most important requirement for commercial growing of watercress. Springs in limestone regions with a flow of some several hundred to several thousand gallons of water per minute are the best source of water.

Watercress obtains nitrogen from the water in which it grows. The higher the nitrogen content, the smaller the flow needed for a given size bed. The water should contain over two parts per million of nitrate even from the larger springs. Smaller springs must contain higher levels to support profitable beds. Commercial laboratories can determine the nitrogen content of the water. A large flow of water is also needed to supply other vital nutrients and to protect the plants from freezing.

Location of Beds

The best site for a watercress bed is on a relatively flat area with a slight slope below the spring. There should be enough slope to assure a complete drainage of the beds. Areas where beds are to be located should be free of immovable rocks or rock outcrops.

Details of bed construction will not be specified here because each site constitutes a different problem. Those who contemplate a substantial commercial installation will need firsthand knowledge of typical installations. The services of an engineer and modern earth-moving equipment will probably be required.

Some points to keep in mind--

- . The size of an individual bed depends partly on the size of the enterprise to be developed and partly on the contours of the site.

- . The individual bed should be no larger than required to furnish the amount of watercress normally harvested in 2 or 3 days. A series of about a dozen beds is required to afford 2- or 3-day harvests for about a month.

- . Where the beds are to extend over an area that slopes more than 2 inches per 100 feet, construct a series of beds at successively lower levels. This is to avoid excessive slope within individual beds and to avoid moving excessive amounts of earth in producing the desired grades of beds.

- . Make bypasses for all beds to carry away surplus supply water, surface drainage, and flood water.

- . If the beds are less than 2 feet deep, construct dikes at the sides of the beds. The dikes should be made of earth and should be several feet thick at the base. Dikes or dams between beds are best constructed of concrete or wood. Where muskrats are a problem, wire barriers should be buried in the dikes. Adjustable gates in the dikes between the beds permit effective control of the water. Construct the dikes so they can be used as walkways.

- . To prepare for the first planting, spread a layer of rich compost 2 to 4 inches deep over the bottoms of the beds. Work it smooth in the same manner that garden soil is prepared for planting.

Planting

Watercress can be grown from either seed or cuttings. New plantings may be started from seed in a plant bed in early spring, if cuttings are not readily available. Small plants from the plant bed are transplanted to permanent beds; there they produce growth from which cuttings can be made for planting additional beds. Once a bed is established, further propagation is usually done with cuttings.

Broadcast the seed thinly over finely prepared compost. Then lightly rake to barely cover the seed. Mixing the seed with several times its volume of dry sand aids in sowing it thinly. An ounce of seed is needed to sow about 70 square yards of plant bed. Properly handled, it produces about 70,000 plants, enough to transplant about 17,500 square feet of permanent bed if plants are spaced 6 inches apart each way.

Keep the plant bed moist. As the seedlings develop, let water into the bed, but not enough to cover them. Seedlings 2 to 3 inches tall are large enough to transplant.

Cuttings are usually transplanted during the summer; care must be taken to avoid carrying pests such as duckweed, snails, and sowbugs into the new bed with the cuttings.

Seedlings and cuttings are usually transplanted about 6 inches apart each way. If plants or cuttings are scarce they may be planted as far apart as 1 foot each way. Close planting is preferred. Use cuttings about a foot long.

Keep plants and cuttings transplanted within a single bed as near uniform length as feasible. Set them firmly upright with 6 to 8 inches or more exposed. Clip the tips of the new growth to induce short, stocky growth.

To supply fresh water without disturbing the newly set plants set the seedlings or cuttings in water about 1 or 2 inches deep that flows slowly through the bed. Start planting at the lower end of a bed, leaving a narrow unplanted band at the upper end to facilitate uniform distribution of water. Beds planted with seedlings or cuttings as described produce a crop by late summer or autumn.

Bed Management

In new plantings harvesting can begin when the new growth is 6 to 8 inches long; harvests can be made about a month apart. Immediately after harvest the stubble should be barely submerged. Clippings can be left in the bed. As new growth develops, raise the water level gradually, leaving several inches of growth above the water.

By late spring or early summer in the southern and middle parts of the country, respectively, market demand and crop quality tend to decrease so that harvesting is suspended. The plants are often allowed to go to seed after the early series of harvests, then in midsummer the water level is lowered to about 3 or 4 inches deep and tops are cut back to water level. At this time, cuttings are planted in any of the vacant spaces in the beds, and the beds are weeded if necessary.

This midsummer cutting back of the plants, the replanting and the cleanup of the beds, prepares them for the production of late summer and autumn crops.

Little is known about the need for or the effective use of fertilizer in watercress beds.

In regions of relatively mild winters, watercress is harvested throughout the winter. Proper control of water level is the chief protection against cold injury; when a drop in temperature endangers the exposed plants the crop should be completely submerged. When the temperature moderates, the water level should be lowered to expose the young growth.

Yields and Life of Beds

Yields of watercress vary among different districts and beds, and from year to year for the same beds. Average yields per cutting are about 2,500 bunches per 1,000 square feet of a well-established bed. Well-managed beds under favorable conditions in the middle and northern districts reach maximum production within a year after planting.

Weeds

Various algae, commonly present in watercress beds, compete with the watercress for nutrients in the water. They are injurious when they form stringy or spongy masses of "moss" that contaminate the harvested product. Sometimes the algae cause an undesirable odor. To kill most algae without undesirable effect on the crop or wildlife add copper sulphate to the water at 2 to 10 parts per million. One pound of copper sulphate in 25,000 gallons of water (about an acre-inch) gives 5 parts per million. Apply it by placing a small cloth bag of the crystals in the water inlet of a contaminated bed.

Duckweed (Lemna) is a tiny water plant that floats at the water surface and sometimes covers the water so densely it smothers the new growth of the submerged watercress after a harvest. Duckweed is difficult to eliminate. Neither raising the water level above the watercress stubble nor spraying the weedy water surface with a saturated solution of copper sulphate will eliminate all the duckweed. It may be necessary to control the weed by draining the bed, cleaning out all the vegetation, and then allowing the soil to dry. This method is expensive but it affords the opportunity to clean up other pests, both plant and animal.

Water speedwell, a large weed that has oval leaves and spikes of blue flowers, has seeds that may persist for years in the bottom of a bed. The only practical control is to maintain a good stand of watercress and to weed the beds regularly.

Animal Pests

Snails feed on watercress and can impair the market value of the harvested product. They can be effectively controlled by draining and drying out infested beds.

The watercress sowbug, a serious pest in the Shenandoah Valley of Virginia, eats the leaves and stems of the watercress, and sets masses of plants adrift. Where this pest is serious, a practical solution is the draining and drying of infested beds. All plant growth and surrounding water should be removed to reduce the rate of reinfestation.

Diseases

Watercress in the United States has not been found to be damaged seriously by diseases. Cercospora leafspot sometimes attacks it, however, first appearing on the older leaves as dirty-white spots that enlarge rapidly, killing the leaf. In beds that are well managed this disease is not known to be troublesome.

Harvesting And Packing

Harvesting, packing, and shipping of highly perishable watercress must be effectively scheduled to insure that no more watercress is harvested than can properly be packed and shipped the day it is harvested.

The tops of the plants are cut by the handful about 6 inches below the tips and are gathered into bunches. The butt is trimmed smooth to form a bunch about 4 inches tall. The bunches are then placed in the water near an elevated walk or dike. Then, they are put into wheelbarrows for hauling to a nearby packing shed. For long hauls from the beds to the packing house the watercress is precooled in a mixture of ice and water before loading.

Various shipping containers are used such as apple barrels holding 300 bunches, orange crates holding 150 bunches, and baskets or crates holding 100 bunches. The use of plastic bags containing one or two bunches extends the display life of the watercress.

Growing Watercress For Home Use

A few plants covering a few square feet will produce enough watercress to supply the average family. It can be grown with little effort if a suitable spring or brook, however small, is conveniently near the house.

Where clean shallow water flows gently over soil, it is only necessary to push the basal ends of a few cuttings into the wet soil and let the plants grow. Little soil is needed.

In spots too rocky or gravelly for planting cuttings or seedlings, a small bed of soil can be prepared in a submerged shallow container. Yields per unit area may be rather low under such "wild" conditions but will still be ample for home use.

When the plants become too rank, or develop an unthrifty appearance, about 1/2 to 2/3 of their length should be trimmed off to stimulate fresh, succulent growth.

Where no spring or brook is available, watercress for home use can be grown in a small spot in the garden, or in a cold frame, that is kept constantly wet by a trickle of irrigation water on the soil surface. Such a spot for watercress should be located where the water applied will not harm other plants.

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